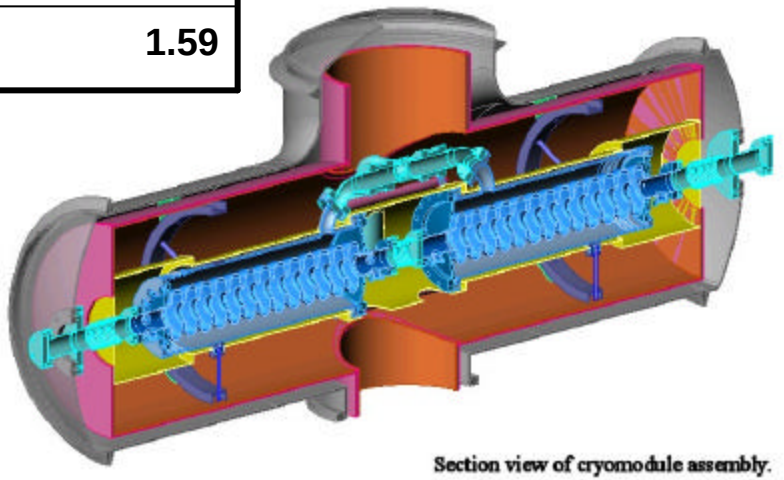
# CKM @ A0 North : Summary of the static heat loads

| CKM cryo-model at A0 North | 75 K - 85 K | 1.8 K |
|---|---|---|
| Thermal radiation (W) | 2.21 | 0.10 |
| Flanges extremities (W) | 5.70 | 0.007 |
| Run1 - iris at 300 K (W) | - | 0.243 |
| Supports spiders (W) | 27.20 | 0.43 |
| Coupler antenna and coaxial cable (W) | 3.74 | 0.21 |
| Warm to Cold Transition (W) | - | 0.60 |
| **TOTAL HEAT LOAD** | **38.85** | **1.59** |



Section view of cryomodule assembly.

The heat transfer between the RF cavities and the Titanium outer sell is not estimated (negligible)

# CKM @ A0 North :What do we want to measure? To complete…

**Goal of the test:**

Validation of the 13 cell SRF cryo-system in its final CKM configuration:

= Run1 in North cave w/o beam – Further run in South cave w/ beam

= 1 x 13 cells – 2 x 13 cells

Thermal investigations:

-Measure the static heat load to the 1.8 K temperature level – model validation.

-Influence of the He II bath temperature

-Temperature distribution in the cryostat

-To complete…

-13 cell SRF performance in an Horizontal configuration…

Note:

Nominal heat load: Measured static heat load due to the feed box and vertical dewar ~ 1.8 Watt.

++> Nominal heat load to investigate for CKM heat load measurement purpose…

# Existing A0 cryogenics instrumentation & control

•LHe dewar and recovery lines

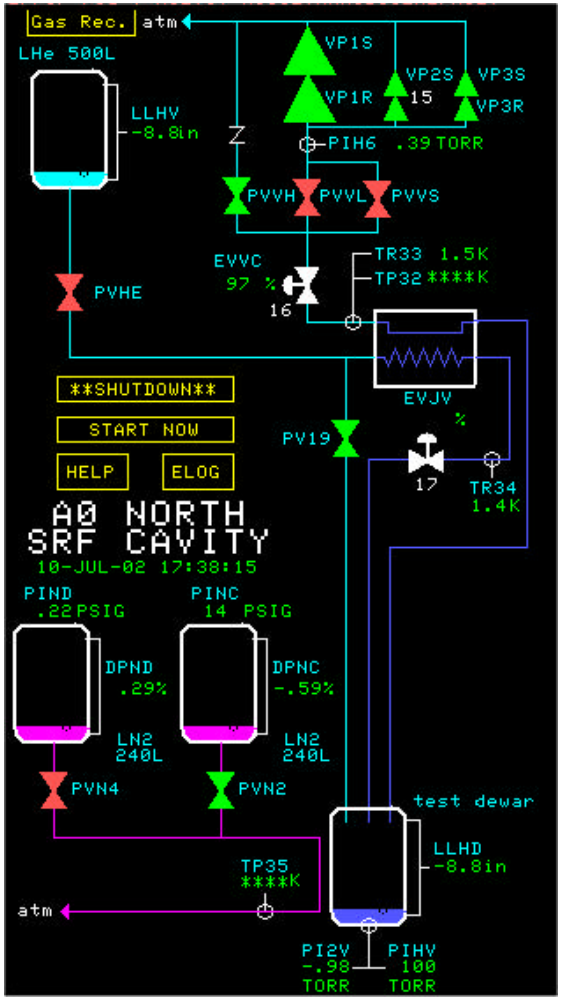
• Pump capacity 2.01 g/s (as measured by Brian Degraff)

(design capacity = 2.64 g/s)

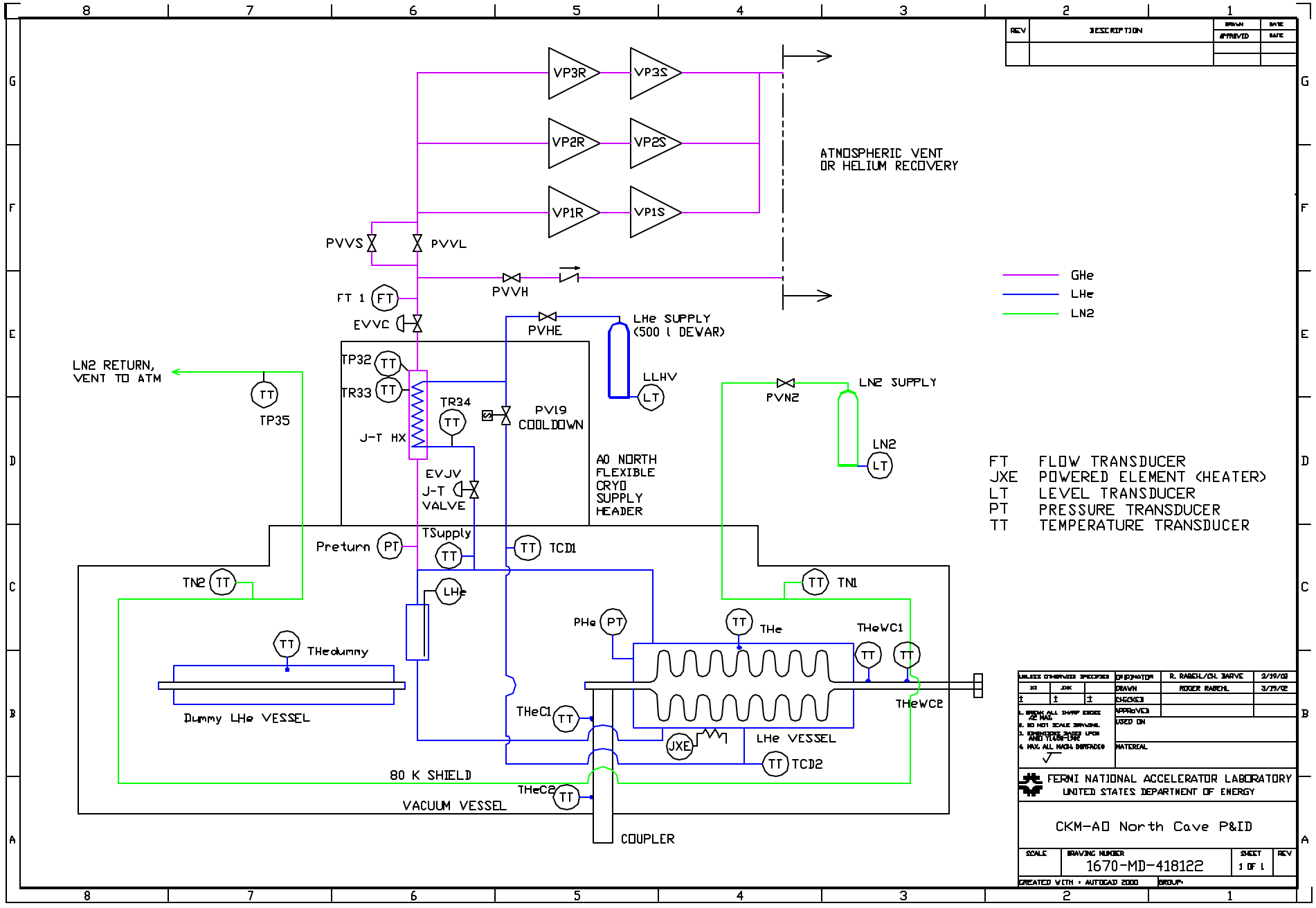
• Instrumentation & control

• Heat exchanger

• EVJT



# CKM @ A0 North - PID



# CKM @ A0 North – Preliminary Instrumentation list

| Sensor name | Location | Type | Company | Range | Comment |
|---|---|---|---|---|---|
| **TN1** | Thermal shield- upstream | PT102 | Lake shore | 30 K-300 K | |
| **TN2** | Thermal shield- downstream | PT102 | Lake shore | 30 K-300 K | |
| **TP35** | LN2 return | Platinum resistor | | 30 K-300 K | already installed at A0 North |
| **TCD1** | He cooldown upstream | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **TCD2** | He cooldown downstream | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **TR34** | JT valve up stream | Carbon resistor | | 1.6 K-300 K | already installed at A0 North |
| **Tsupply** | JT valve down stream | CX-1050-SD-1.4L | | 1.6 K-300 K | |
| **TP32** | Low pressure He | Platinum resistor | | 1.6 K-300 K | already installed at A0 North |
| **TR33** | Low pressure He | Carbon resistor | | 1.6 K-300 K | already installed at A0 North |
| **The** | Helium vessel | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **Thedummy** | Dummy Helium vessel | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **THeWC1** | Warm to cold transition | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **THeWC2** | Warm to cold transition | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **THeC1** | Coupler | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **THeC2** | Coupler | CX-1050-SD-1.4L | Lake shore | 1.6 K-300 K | |
| **Preturn** | Helium vessel | C204 | Setra | 0 - 10 psig | |
| **PHe** | Helium vessel | C204 | Setra | 0 - 10 psig | |
| **FT 1** | He Flow meter | FTB-941 | Omega | 0 - 5 g/s | From photon stop cryotest |
| **LHe** | LHe level | 6" level | AMI | 0 -100 % | |
| **LLHV** | LHe level | | | 0 -100 % | already installed at A0 North |
| **LN2** | LN2 level | | | 0 -100 % | already installed at A0 North |
| **EVJT** | JT valve | | | 0 -100 % | already installed at A0 North |
| **EVVC** | Pumping valve | | | 0 -100 % | already installed at A0 North |
| **PVHE** | LHe dewar supply valve | | | 0 -100 % | already installed at A0 North |
| **PVN2** | LN2 dewar supply valve | | | 0 -100 % | already installed at A0 North |
| **PVVH** | Safety recovery | | | 0 -100 % | already installed at A0 North |
| **PVVL** | Pumping system valve | | | 0 -100 % | already installed at A0 North |
| **PVVS** | Pumping system valve 2 | | | 0 -100 % | already installed at A0 North |
| **PV19** | Cooldown valve | | | 0 -100 % | already installed at A0 North |
| **JXE** | Cavity heater | KHLV-105/10 | Omega | 50 W | |

# CKM @ A0 North – DAQ system

New instrumentation:

- 9 CX => excitation current = 1 microAmp / output = 0-10 V
- 2 Pt => excitation current = 100 microAmp / output = 0-10 V
- 2 PT => Input = 28 V / output = 0-5 V
- 1 FT => Input = 30 mV / output = 0-5 V
- 1 LT => Input = 30 mV / output = 0-5 V
- 1 JXE => Input = 28 V / output = 0-2 Amp

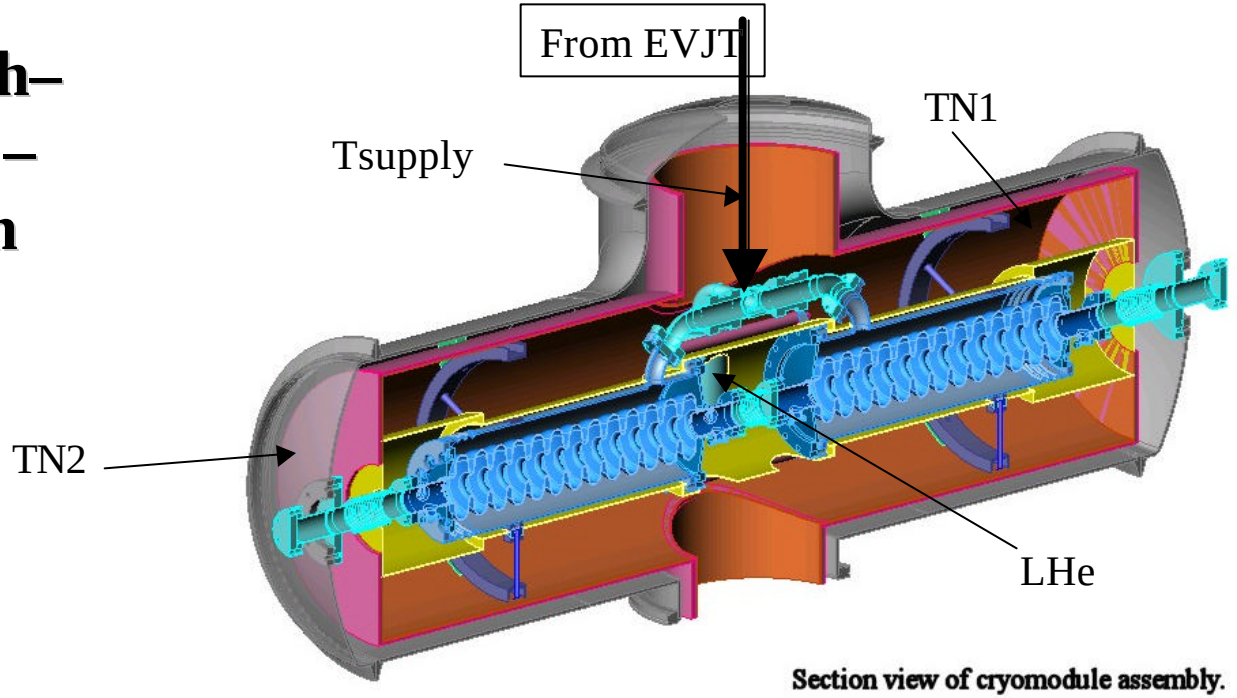
Check reliability of existing Carbon temperature sensors:

- TR34 and TR33

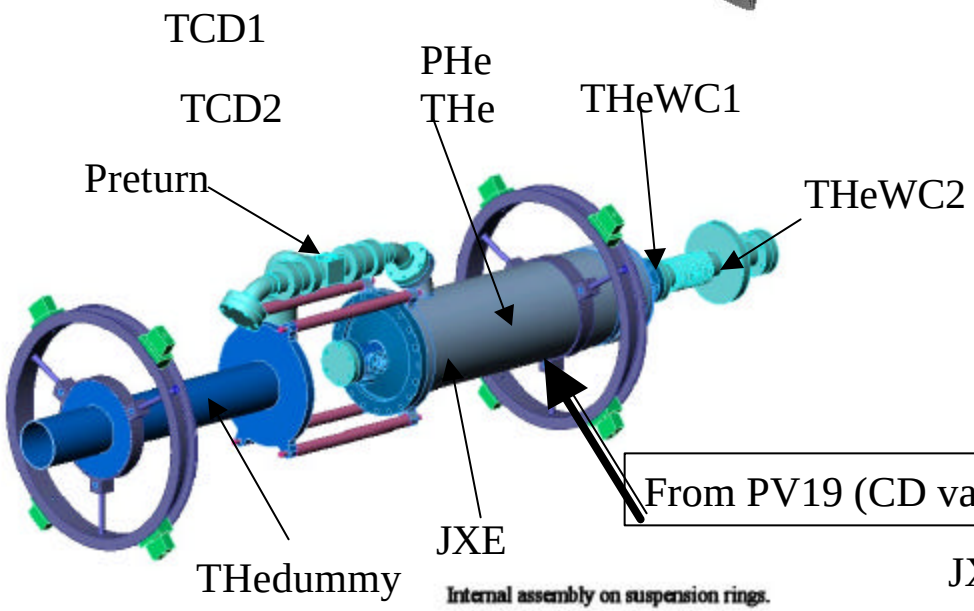
Potential DAQ systems:

- ACNET spare channels from A0 compressor I/O box
- IRM
- PC card (IO Tech)
  - Current supply, DVM, Switch sys., or expansion box for PC card

# CKM @ A0 North– Cryostat Design – Instrumentation

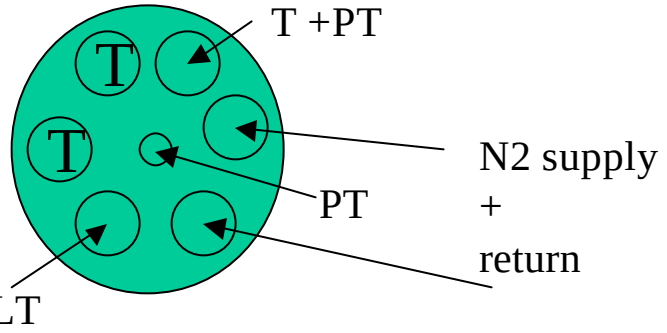


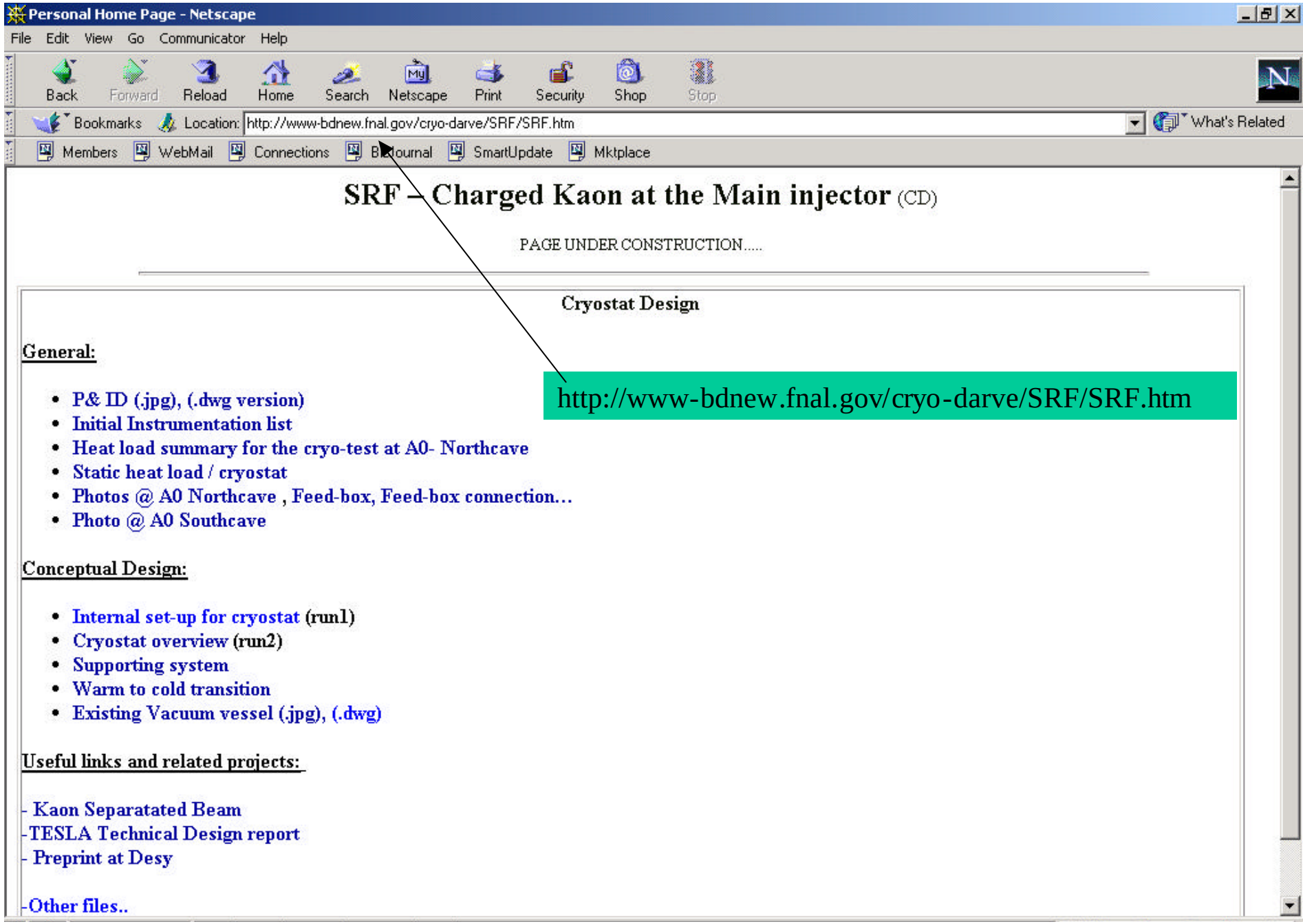

Section view of cryomodule assembly.



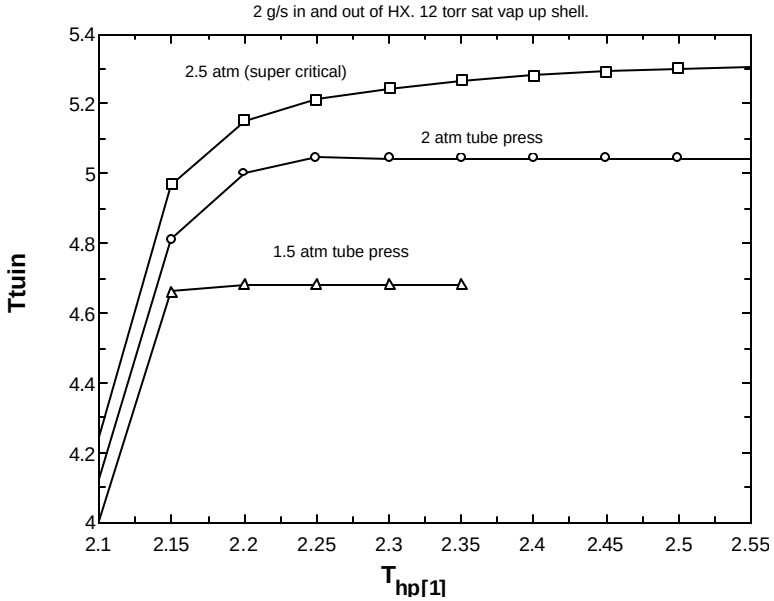

Internal assembly on suspension rings.

- Side Flange: Insulation vacuum pump
- Side Flange: Instrumentation




Personal Home Page - Netscape
File Edit View Go Communicator Help
Back Forward Reload Home Search Netscape Print Security Shop Stop
Bookmarks Location: http://www-bdnew.fnal.gov/cryo-darve/SRF/SRF.htm What's Related
Members WebMail Connections SmartUpdate Mktplace
SRF – Charged Kaon at the Main injector (CD)
PAGE UNDER CONSTRUCTION.....
Cryostat Design
General:
P& ID (.jpg), (.dwg version)
Initial Instrumentation list
Heat load summary for the cryo-test at A0- Northcave
Static heat load / cryostat
Photos @ A0 Northcave , Feed-box, Feed-box connection…
Photo @ A0 Southcave
Conceptual Design:
Internal set-up for cryostat (run1)
Cryostat overview (run2)
Supporting system
Warm to cold transition
Existing Vacuum vessel (.jpg), (.dwg)
Useful links and related projects:
- Kaon Separatated Beam
-TESLA Technical Design report
- Preprint at Desy
-Other files..
http://www-bdnew.fnal.gov/cryo-darve/SRF/SRF.htm

# CKM @ A0 North - Feed box characteristics




**Properties of the JT valve @ A0**
**Assumption: Pressure before JT = 1.5 atm (22.04 psi)**